

Perhaps no medical technological advance has been more widely heralded than the development of antibiotics. It is routinely lauded as one of the primary accomplishments of the application of science and modern medicine in Western culture—the success of the scientific method over the medicine of the past. But the advent of antibiotics has also led to a number of unforeseen medical problems, not the least of which is the development



of powerful strains of antibiotic-resistant bacteria. Fortunately, the advancement of modern medicine can meet the ancient wisdom of the past to overcome these problems with the use of natural allies: herbal alternatives to antibiotics.

### **The Rise and Overuse of Antibiotics**

The excitement over the discovery and successful use of antibiotics in medicine was so strong in the late 1950s and early 1960s that many physicians, including my great-uncle Lee Burney, then surgeon general of the United States, and my grandfather David Cox, president of the Kentucky Medical Association, jointly proclaimed the end for all time of epidemic disease. In a 1963 comment, the Australian physician and Nobel laureate Sir F. Macfarlane Burnet claimed that, by the end of the 20th century humanity would see the “virtual elimination of infectious disease as a significant factor in societal life.”

Seven years later, one of my great-uncle’s successors, Surgeon General William Stewart, testified to Congress that it was time “to close the book on infectious diseases.” Smallpox was being eradicated and polio vaccines were showing astonishing success in preventing infection in millions of people in the United States, Africa and Europe. Tuberculosis and malaria, it was predicted, would be gone by the year 2000. With satisfaction, David Moreau observed in an article in *Vogue* magazine that “the chemotherapeutic revolution [had] reduced nearly all non-viral disease to the significance of a bad cold.”

They couldn’t have been more wrong.

In spite of Moreau’s optimism, when his article appeared in 1976, infectious disease was already on the rise. By 1997, it had become so bad that 3 million people a year in the United States were being admitted to hospitals with difficult-to-treat antibiotic-resistant bacterial infections. The Centers for Disease Control and Prevention estimated in 2002 that another 1.7 million became infected annually while visiting hospitals and an estimated 100,000 a year died after contracting a resistant infection in a hospital.

“To reiterate,” says Brad Spellberg of the Infectious Diseases Society of America, “these people come into the hospital for a heart attack, or cancer, or trauma after a car accident, or to have elective surgery, or with some other medical problem and then ended up dying of infection that they picked up in the hospital. ... The number of people who die from hospital-acquired infections is unquestionably much higher now, and is almost certainly more than 100,000 per year in the United States alone.”

This would make hospital-acquired resistant infections, by conservative estimates, the fourth leading cause of death in the United States. The death toll from infectious diseases in general (the same infectious diseases that were going to be eradicated by the year 2000) is much higher. R. L. Berkelman and J. M. Hughes wrote in 1993 in the *Annals of Internal Medicine* that “the stark reality is that infectious diseases are the leading cause of death worldwide and remain the leading cause of illness and death in the United States.”

Pathologist and researcher Marc Lappe went even further, declaring in his book *When Antibiotics Fail* (North Atlantic, 1995), “The period once euphemistically called the ‘Age of Miracle Drugs’ is dead.”

## **The End of Miracle Drugs**

Though penicillin was discovered in 1929, it was only with World War II that it was commercially developed and it wasn't until after the war that its use became routine. Those were heady days. It seemed science could do anything. New antibiotics were being discovered daily; the arsenal of medicine seemed overwhelming. In the euphoria of the moment, no one heeded the few voices raising concerns. Among them, ironically enough, was Alexander Fleming, the discoverer of penicillin. Fleming noted as early as 1929 in the *British Journal of Experimental Pathology* that numerous bacteria were already resistant to the drug he had discovered, and in a 1945 *New York Times* interview, he warned that improper use of penicillin would inevitably lead to the development of resistant bacteria. Fleming's observations were prescient.

At the time of his interview, just 14 percent of *Staphylococcus aureus* bacteria were resistant to penicillin; by 1953, as the use of penicillin became widespread, 64 percent to 80 percent of the bacteria had become resistant; resistance to tetracycline and erythromycin was also being reported. (In 1995, an incredible 95 percent of staph was resistant to penicillin.) By 1960, resistant staph had become the most common source of hospital-acquired infections worldwide. So physicians began to use methicillin, a *beta*-lactam antibiotic that they found to be effective against penicillin-resistant strains.

Methicillin-resistant staph (MRSA) emerged within a year. The first severe outbreak in hospitals occurred in the United States in 1968—a mere eight years later. Eventually, MRSA strains resistant to all clinically available antibiotics except the glycopeptides (vancomycin and teicoplanin) emerged. And by 1999, 54 years after the commercial production of antibiotics, the first staph strain resistant to all clinical antibiotics had infected its first three people.

Originally limited to patients in hospitals (the primary breeding ground for such bacteria), by the 1970s resistant strains had begun appearing outside hospitals. Now they are common throughout the world's population. In 2002, I saw my first resistant staph infection outside a hospital setting. By 2011, I was receiving monthly calls and emails about them.

This rate of resistance development was supposed to be impossible. Evolutionary biologists had insisted that evolution in bacteria (as in all species) could come only from spontaneous, usable mutations that occur with an extremely low frequency (from one out of every 10 million to one out of every 10 billion mutations) in each generation. The idea that bacteria could generate significant resistance to antibiotics in only 35 years was considered impossible. The thought that the human species could be facing the end of antibiotics only 60 years after their introduction was ludicrous. But in fact, bacteria are showing extremely sophisticated responses to the human “war” on disease.

## **The Rise of Bacterial Resistance**

The thing that so many people missed, including my ancestors, is that *all* life on Earth is highly intelligent and adaptable. Bacteria are the oldest forms of life on this planet and they have learned very, very well how to respond to threats to their well-being. Among those threats are the thousands if not millions of antibacterial substances that have existed as long as life itself.

One of the crucial understandings that those early researchers ignored, though tremendously obvious now (only hubris could have hidden it so long), is that the world is filled with antibacterial substances, most produced by other bacteria, as well as fungi and plants.

To survive, bacteria learned how to respond to those substances a very long time ago. Or as Steven Projan of Wyeth Research puts it, bacteria “are the oldest of living organisms and thus have been subject to 3 billion years of evolution in harsh environments and therefore have been selected to withstand chemical assault.”

What makes the problem even more egregious is that most of the antibiotics originally developed by human beings came from fungi—fungi that bacteria had encountered a very long time ago. Given those circumstances, *of course* there were going to be problems with our antibiotics. It’s possible that if our antibiotic use had been restrained, the problems would have been minor.

But it hasn’t been; the amount of pure antibiotics being dumped into the environment is unprecedented in evolutionary history. And that has had tremendous impacts on the bacterial communities of Earth, and the bacteria have set about solving the problem they face very methodically. Just like us, they want to survive, and just like us, they are very adaptable. In fact, they are much more adaptable than we ever will be.

### **What Is Good Bacteria and Why We Need Some**

The bacteria that colonize our bodies are friendly, mutualistic bacteria. They take up all the space on and in our bodies on which bacteria can grow. By doing so, they leave no room for other, less benign bacteria to live. But the relationship goes beyond this. *All* of our co-evolutionary bacteria generate antibiotic substances that kill off other, less friendly bacteria. The *Streptococcus* bacteria that normally live in our throats produce large quantities of antibacterial substances that are specifically active against the *Streptococcus pyogenes* bacteria that cause strep throat.

Regular exposure to pathogenic bacteria as we are growing teaches our bodies and our symbiotic bacteria how to respond most effectively to disease organisms. This produces much higher levels of health later in life. Research continually finds that children who are “protected” from bacteria by keeping them in exceptionally clean environments where they are constantly exposed to antibacterial soaps and wipes are not in fact healthier but much sicker overall than children not so protected. The constant exposure to a world filled with bacteria, the world out of which we emerged as a species, in fact stimulates the immune health of all of us as we grow. We actually *need* to come into contact with the microorganisms of the world to be healthy.

### **So why bother with antibiotics?**

It is clear that antibiotics are not going to be used any less and in fact they are being used at far greater rates than they were 15 years ago. The human species, as a group, has never really been known for doing the sensible thing before it is too late. We will stop using antibiotics only when they truly fail to work. And even then most of the people in the Western world will still try to hold on to them and our fatally flawed approach to bacterial disease.

But for those who want to truly empower themselves and their families and prepare for the time that is so quickly approaching us, there are options. You can take control over your own health and health care. You can prepare. You can learn to use herbal medicines to heal yourself from disease. And you can learn what to do if you find that one day you need to know how to treat a resistant infection.

## About Alternatives to Antibiotics

To find the top herbs that can be effectively used for treating antibiotic-resistant organisms, I have relied on decades of my own experience, the cumulative experience of a great many other practitioners, many thousands of journal papers of very good research by committed researchers from many countries around the world, and the history of use of these plants by local peoples over centuries.

**Systemic antibacterials** are herbal medicines that are broadly systemic, that are spread by the bloodstream throughout the body, thus affecting every cell and organ within the body, and that are active against a range of bacteria. These herbs are good for treating infections such as MRSA that have spread throughout the body and are not responding to multiple antibiotic protocols.



*Example:* **Artemisia (*Artemisia annua*)** is a systemic antibacterial that contains artemisinin, an active constituent known for its effectiveness in treating malaria. The aerial parts of this herb, including the flowers, have the highest artemisinin content.

**Localized antibacterials** are those that do not spread easily throughout the body but are limited in their movement. Because they don't easily cross membranes, they are effective in the GI and urinary tracts and for external infections. These kinds of herbs are useful for infections such as *E. coli* O157:H7 or cholera or for infected skin wounds that refuse to heal.



*Example:* **Juniper (*Juniperus spp.*)** is a localized antibacterial that is high in vitamin C. Its berries and needles are typically used, although its bark, wood and root are also active. To use, prepare chopped juniper needles as a standard infusion, or eat a small handful of berries.

**Facilitative or synergistic herbs** are just that: plants that facilitate the action of other plants or pharmaceuticals. They either enhance the action of the antibacterial being used or affect the bacteria so that the antibacterial is more effective. Most plants contain both antibiotic substances *and* a potent synergist.

*Example:* **Ginger (*Zingiber officinale*)** is a synergistic herb used for colds and flu, nausea and poor circulation. Benefit from this culinary herb by taking the fresh juice of the root as a hot tea—its most potent form. However you use it, ginger's root is the active portion of the plant.

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## **12 Herbal Alternatives to Antibiotics**

Stephen Harrod Buhner recommends these 12 herbs in his book *Herbal Antibiotics* (Storey Publishing, 2011).

### **Systemic Herbs**

These five systemic herbs can be very helpful in treating systemic infections such as resistant staph, MRSA, tuberculosis and malaria.

- Cryptolepis (*Cryptolepis sanguinolenta*)
- Sida (*Sida acuta*)
- Alchornea (*Alchornea cordifolia*)
- Bidens (*Bidens pilosa*)
- Artemisia (*Artemisia annua*)

### **Non-Systemic Herbs**

These three localized non-systemic herbs treat resistant infections of the GI tract, urinary tract and skin.



- American goldenseal (*Hydrastis canadensis*)

Goldenseal is also particularly active against most food poisoning bacteria such as *E. coli* and *salmonella*.

- Juniper (*Juniperus* spp.)
- Usnea (*Usnea* spp.)
- Honey

### **Synergistic Herbs**

Synergistic herbs increase the activity of other herbs. These three will boost inactive resistant bacteria mechanisms, increase the presence of antibacterial agents in the body and enhance immune function.

- Licorice (*Glycyrrhiza glabra* and *G. uralensis*)
- Ginger (*Zingiber officinale*)
- Black pepper (*Piper nigrum* and *P. longum*)